Sept. 8, 1931. S. A. NEIDICH 1,822,538

METHOD OF AND MEANS FOR TREATING ARTICLES OF CELLULOID AND THE LIKE

Filed March 13, 1929

FIG. I.

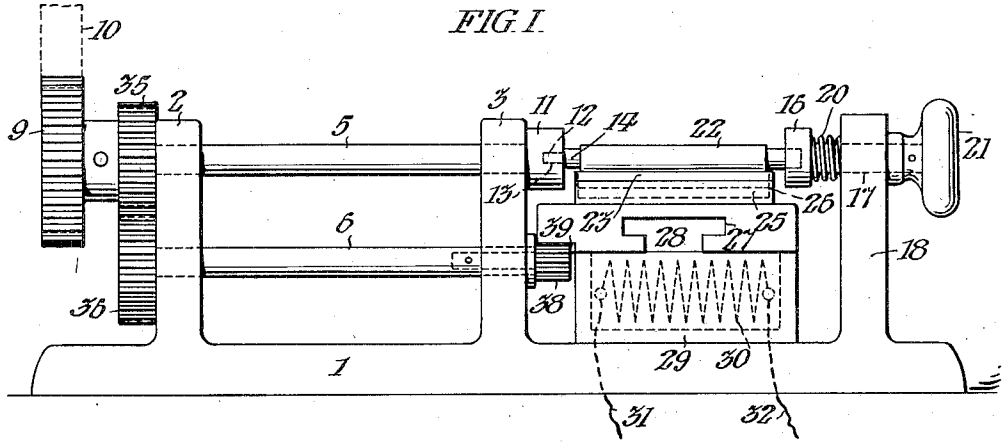


FIG. II.

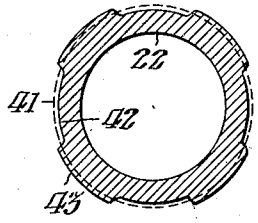


FIG. III.

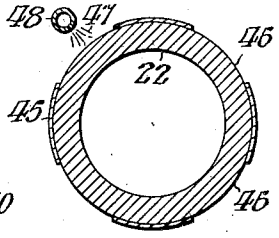


FIG. IV.

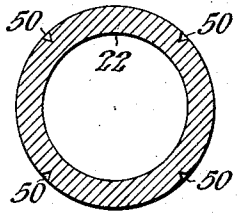
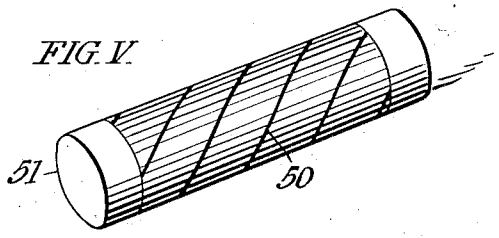


FIG. V.



INVENTOR:
SAMUEL A. NEIDICH,
by William E. Paige,
Attorney.

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UNITED STATES PATENT OFFICE

SAMUEL A. NEIDICH, OF EDGEWATER PARK, NEW JERSEY

METHOD OF AND MEANS FOR TREATING ARTICLES OF CELLULOID AND THE LIKE

Application filed March 13, 1929. Serial No. 346,788.

My invention relates to products of cellulose, such as celluloid, cellulose nitrate, cellulose acetate and the like, and the object and effect thereof are to form a pattern upon such material and particularly upon tubes which are adapted to form the bodies and caps for fountain pens, pencils, and the like. Such tubes may be formed by rolling comparatively thin sheets of such material upon a mandrel, while softened with any suitable solvent. For instance, acetone is a suitable solvent for celluloid and cellulose nitrate, and ethyl acetate, or a mixture of alcohol and ether, are suitable solvents for cellulose acetate.

I am aware that imprints of the name and address of manufacturers of such writing implement casings have been made on such casings by indenting them with a roller or rollers in what may be termed a knurling operation. However, such rollers are difficult and costly to produce and are not adapted for attaining some of the effects characteristic of my invention.

As hereinafter described, an essential feature of my improved method is impressing the outer surface of the article of celluloid or the like, by rolling the same in contact with a pattern element extending in a plane tangential to the perimeter of said article.

The advantage of such a method and means of imposing a pattern is that the pattern element may be made by any ordinary process of engraving, photographing, or electrotyping adapted for use in producing printing elements for illustrations and at far less cost than the rotary devices aforesaid. Moreover, it is easier to provide means for heating such pattern plates to facilitate the making of impressions therefrom by the softening effect of heat upon the cellulose products aforesaid.

My invention includes the various novel features of the method and means hereinafter more definitely specified.

In said drawings; Fig. I is a front elevation of a mechanism including means for effecting my improved method.

Fig. II is a cross sectional view of a tube of celluloid and the like, which has been impressed to form both intaglio and cameo regions thereon.

Fig. III is a cross sectional view of a tube of celluloid and the like, having regions thereof coated with material adapted to resist the action of dye.

Fig. IV is a cross sectional view of a tube of celluloid or the like having pattern indentations formed therein by my improved method and means.

Fig. V is a perspective view of a cylinder with a pattern imposed upon the surface thereof by my improved method and means.

Referring to Fig. I; the base frame 1 has standards 2 and 3 in which are journaled shafts 5 and 6. Said shaft 5 is the main driving shaft and is conveniently adapted to be rotated by the gear wheel 9 fixed thereon and adapted to be engaged by a motor gear 10. Said shaft 5 carries the head stock 11 having the recess 12 adapted to engage the flattened end 13 of the cylindrical mandrel 14, which is detachably engaged at its opposite end in the tail stock 16 carried by the idle rotary shaft 17 which is journaled in the standard 18 of said frame 1. Said tail stock 16 is normally pressed to the left in Fig. I, to engage said mandrel 14, by the spring 20 which encircles said shaft 17, and the latter has the knob handle 21 by which said stock 16 may be withdrawn to the right to release said mandrel. Said mandrel has, temporarily rigidly connected therewith, the tube 22 of celluloid or the like upon which the pattern is to be imposed.

The pattern element 23 which is to be used to impress the outer surface of the tube 22 extends in a plane tangential to the perimeter of said article 22 and, as above contemplated, may be an embossed or recessed plate formed by any suitable process. Said pattern element 23 is temporarily rigidly mounted upon the slide 25, conveniently by a pair of clamp members 26 at respectively opposite ends thereof, only one being shown in Fig. I. Said slide 25 has the slideway 27 therein fitted on the guide rail 28 which is stationary upon the top of the box 29 which is rigidly connected with said frame 1. Said box may include any suitable heating means, as a body

of hot fluid. However, I find it convenient to employ the electric heating coil 30 which is supplied with electrical energy thru the conductors 31 and 32.

The effect of the heating element in the box 29 is to maintain the slide 25 and pattern element 23 at any desired temperature to facilitate the impressing of the pattern element upon the celluloid or the like 22. For instance, it is desirable to maintain the pattern element at a temperature slightly above 212° F., for softening celluloid.

However, if the article 22 has been formed by rolling a sheet of celluloid or the like while softened with a suitable solvent or if it has been subsequently softened the article is sufficiently plastic to be readily deformed by a pattern member, without the aid of heat, while thus softened.

Altho said slide 25 may be caused to move tangentially with respect to the perimeter of the article 22, merely by frictional engagement with the surface of the latter; I find it desirable to positively move the pattern element at the same surface speed as the perimeter of the article upon which the pattern is to be imposed. Therefore, I find it convenient to provide said shaft 5 with the gear 35 in mesh with the gear 36 on the shaft 6, and to provide the latter with the gear 38, the pitch diameter of which is the same as the diameter of the article 22. Said gear 38 engages the rack 39 on the slide 25 so as to move the latter and the pattern element 23, at the same surface speed as the article 22, when both are turned by the gearing connections above described. It is to be understood that a pattern may be imposed, by the element 23, upon the article 22, by rolling the article in contact with the pattern element during a single rectilinear movement of the latter. Such movement may be limited by the length of the rack 39; so that the slide 25 comes to rest at the end of the impressing operation.

Thereupon, the mandrel 14 may be released by withdrawing the knob handle 21 to the right and another mandrel be inserted and the slide 25 be manually replaced, in its original position, and the rectilinear movement thereof be repeated by engagement of said rack 39 with said gear 38, and so on.

The method and means above described may be utilized in several different ways. For instance, an article 22 of the original outside diameter indicated at 41 in Fig. II, may be impressed by a suitable pattern element 23, to form intaglio recesses 42 and cameo projections 43 upon its outer surface, without removal of any of the material. However, as indicated in Fig. III, an article 22 may be initially provided with a continuous coating of paraffin or other dye resisting material 45 and, by rolling contact with a suitable pattern element 23, portions of such dye resisting material 45 may be removed at regions 46 of said article 22 so as to expose the article to the action of dye 47 which may be blown thereon thru an air brush tube 48. After such dyeing operation; the dye resisting material 45 may be removed, conveniently by warming the article 22.

In Fig. IV, the article 22 is indented at its outer surface, by a suitable pattern element 23, so as to form recesses 50. Such recesses may be filled with dye resisting material, such as above contemplated, while the other portions of the perimeter of said article 22 are dyed; or said recesses 50 may be filled with an enamel differing in color or texture in comparison with the material of the tube 22. For instance, Fig. V shows a cylinder 51 having such pattern marks 50 thereon.

Therefore, I do not desire to limit myself to the precise details of my improved method and means herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention, as defined in the appended claims.

I claim:

1. The combination with a base frame; of a heater on said frame; and axially alined rotary head and tail stocks above said heater; whereby an article may be engaged between said stocks and contemporaneously turned and heated; wherein a slide is mounted to reciprocate transversely to the axis of said stocks, between said stocks and said heater.

2. The combination with a base frame; of a heater on said frame; and axially alined rotary head and tail stocks above said heater; whereby an article may be engaged between said stocks and contemporaneously turned and heated; wherein a slide is mounted to reciprocate transversely to the axis of said stocks, between said stocks and said heater; and actuating mechanism positively cooperatively connects one of said stocks and said slide; whereby said stock is turned and said slide moved rectilinearly at the same time.

3. The combination with a base frame; of a heater on said frame; and axially alined rotary head and tail stocks above said heater; whereby an article may be engaged between said stocks and contemporaneously turned and heated; wherein a slide is mounted to reciprocate transversely to the axis of said stocks, between said stocks and said heater; and actuating mechanism positively cooperatively connects one of said stocks and said slide; including a gear rack on said slide and a gear adapted to mesh with said rack; whereby said stock is turned and said slide moved rectilinearly at the same time, in coordinate relation.

4. The combination with a base frame; of a driving shaft journaled in said frame;

a head stock carried by said driving shaft; a tail stock mounted to turn idly and axially reciprocate in said frame in coaxial relation with said head stock; a spring stressing said tail stock toward said head stock; a countershaft journaled in said frame parallel with said driving shaft; gears operatively connecting said driving and countershafts; a rack gear carried by said countershaft; a slide mounted to reciprocate on said frame transversely to the axes of said shafts; and a gear rack on said slide adapted to mesh with said rack gear.

5. Apparatus as in claim 4; including a heater interposed between said frame and slide; whereby said slide may be heated during the turning movement of said stocks and rectilinear movement of said slide.

In testimony whereof, I have hereunto signed my name at Burlington, New Jersey, this 31st day of January, 1929.

SAMUEL A. NEIDICH.